Space Weather Forecast

Issued on Saturday, 15 October 2022 at 13:01 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate flare risk decreasing

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has returned to Low or Very Low levels, with isolated low level Common class flares. The large sunspot that was on the northwest limb has now rotated over the horizon and is no longer visible on the Earth-facing solar surface, but its associated magnetic structure is visible above the Sun's northwest limb. This leaves one numbered and two un-numbered small and simple sunspots on the disc, in the northwest quadrant. There are also a number of filaments (lines of material held together by the Suns magnetic field) on the Earth-facing disc. These can be a source of coronal mass ejections (CMEs), and one of these erupted in the southwest at 14/2200 UTC. Modelled results indicate that the bulk of the ejecta will pass below Earth orbit, and although a weak glance around midnight UTC on the 18th is possible, no significant impacts are anticipated.

No other Earth-directed CMEs have been observed.

Solar Wind / Geomagnetic Activity: The solar wind, is indicative of the connection with CH32, perhaps combined with some weak CME influence at first. Background speeds at 380 km/s increased, at times rather erratically, to peak at recent elevated levels of 530 km/s. The total magnetic field strength, was was often Moderate, with peak values near the start of the period, but has become weak in recent hours. The important north-south component, fluctuated moderately and was southward directed (negative) at first, also with peak values. This measure similarly has become weak in recent hours. Geomagnetic activity was Active (Kp 4) 14/1200-1500UTC, and G1/Minor Storm 15/0000-0300UTC. Otherwise, Quiet to Unsettled (Kp 1 to 3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be mostly Low, with a chance of rising to Moderate on day 1 (15th), mainly from any flares from the sunspot that has rotated over the limb. While this is no longer on the Earth-facing disc, the associated magnetic looping remains visible above the northwest limb, potentially allowing any notable flares to be observed from Earth.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs, however the peripheral effects of a CMEs passing south of Earth late day 2 or 3 (16th or 17th), and again around midnight UTC on the 18th may be observed. Otherwise, the ongoing fast wind influence from the coronal hole is expected to ease towards background. Geomagnetic activity is forecast to be Quiet to Unsettled, but with a chance of Active intervals early day 1 (15th), or late day 2 (16th) into early day 3 (17th), and again around midnight UTC on the 18th.

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Energetic Particles / Solar Radiation: The count rate of energetic particles is expected to remain at background levels with no solar radiation storms occurring.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	5	5	5
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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